

CLAIMS

1. An optical detection system comprising:

a spatial light modulator for modulating the phase of incoming light;

5 a photodetector having a plurality of photosensitive areas to receive the light of which the phase has been modulated by the spatial light modulator;

a photosensor selecting section for selecting at least one of the photosensitive areas and activating the selected
10 photosensitive area effectively; and

a modulation control section for providing a modulation pattern, associated with the photosensitive area that has been selected by the photosensor selecting section, for the spatial light modulator.

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2. The optical detection system of claim 1, wherein the photosensor selecting section cyclically switches the photosensitive areas to select by a time sequential technique, and

20 wherein synchronously with this switching operation, the

modulation control section provides a modulation pattern, which produces appropriate imaging ability in the photosensitive area selected, for the spatial light modulator.

5 3. The optical detection system of claim 1 or 2, wherein the modulation control section picks one of a plurality of prepared modulation patterns according to the photosensitive area selected.

10 4. The optical detection system of one of claims 1 to 3, wherein the spatial light modulator is arranged on an optical path of an imaging optical system.

15 5. The optical detection system of claim 1, wherein the incoming light entering the spatial light modulator includes light rays with multiple different wavelengths.

20 6. The optical detection system of claim 5, wherein the photosensor selecting section chooses, as light to be modulated, a light ray falling within a particular wavelength

range from the light rays with the multiple wavelengths.

7. The optical detection system of claim 6, wherein the
photosensor selecting section cyclically switches the light
5 rays to choose by a time sequential technique, and

wherein synchronously with this switching operation, the
modulation control section provides a modulation pattern,
which produces appropriate imaging ability with respect to the
light ray chosen, for the spatial light modulator.

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8. The optical detection system of claim 4, wherein the
imaging optical system selectively exhibits one of multiple
types of imaging characteristics, and

wherein the optical detection system further includes an
15 imaging information sensing section for sensing information
about the imaging characteristic that has been selected from
the multiple types of imaging characteristics, and

wherein in accordance with the output of the imaging
information sensing section, the modulation control section
20 provides a modulation pattern, which produces an appropriate

imaging ability, for the spatial light modulator.

9. The optical detection system of claim 8, wherein the imaging characteristic is an imaging magnification.

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10. The optical detection system of one of claims 1 to 9, wherein the modulation control section provides a modulation pattern, which deviates the incoming light that has entered at least a portion of the spatial light modulator out of the photosensitive area selected, for the spatial light modulator.

11. The optical detection system of claim 10, wherein the modulation control section provides a modulation pattern, which changes the area of that portion of the spatial light modulator, for the spatial light modulator.

12. The optical detection system of claim 11, wherein the modulation control section selectively provides either a first modulation pattern, which makes the area of that portion of the spatial light modulator relatively large, or a

second modulation pattern, which makes the area of that portion of the spatial light modulator relatively small, for the spatial light modulator, and controls the respective durations of the first and second modulation patterns.

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13. The optical detection system of one of claims 10 to 12, wherein the light that has been deviated out of the photosensitive area selected is incident on another photosensitive area of the photodetector.

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14. The optical detection system of one of claims 1 to 13, further comprising a position change detecting section for detecting a change of the position of the optical detection system,

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wherein in accordance with the output of the position change detecting section, the modulation control section generates a modulation pattern that compensates for a shift in focal point caused by the position change.

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15. The optical detection system of one of claims 1 to

14, wherein each of the photosensitive areas in the photodetector has a plurality of pixels arranged at a pitch, and

wherein the modulation control section provides a modulation pattern, which focuses the incoming light at multiple points that are shifted from each other by a distance corresponding to the pixel pitch of the photodetector, for the spatial light modulator.

10 16. The optical detection system of one of claims 1 to 15, wherein the spatial light modulator is a deformable mirror.

15 17. The optical detection system of claim 16, wherein the deformable mirror includes: a plurality of light reflecting areas that are arranged on a substrate; and an actuator for displacing the light reflecting areas at least perpendicularly to the substrate.

20 18. The optical detection system of claim 17, wherein

the deformable mirror is coupled to multiple actuators that are associated with the respective light reflecting areas, and wherein by driving the actuators independently of each other, the light reflecting areas are displaced
5 perpendicularly to the substrate and/or tilted with respect to the substrate.

19. The optical detection system of one of claims 1 to 15, wherein the spatial light modulator is a liquid crystal
10 element.

20. The optical detection system of one of claims 1 to 19, wherein each of the photosensitive areas of the photodetector includes a photoelectric modulating section,
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wherein the optical detection system further includes:

a memory for storing the outputs of the photoelectric modulating section in the photosensitive area that has been selected by the photosensor selecting section; and

20 a reconstructing section for reconstructing an overall

image by rearranging the outputs stored in the memory.

21. The optical detection system of one of claims 1 to
19, wherein the photodetector is a storage medium, of which a
5 physical property changes when exposed to a radiation, and
includes a shutter member that allows the photosensor
selecting section to selectively transmit or cut off the
incoming light.

10 22. The optical detection system of one of claims 1 to
21, wherein the spatial light modulator functions as an
optical low pass filter.